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Main

Useful **FARM INFORMATION**

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The business of farming is the largest single industry in America. Over one-third of the people in this country make their living in farming or in business and industry that is directly or indirectly dependent on farming. The Great Upper Midwest is virtually the heart of America's farming industry. Being blessed with an abundance of fertile soil, favorable climate and adequate water, there is probably no other similar area in the world that feeds so many people so well.

Obtaining the maximum economical production from our farms, and at the same time conserving the valuable land resources for future generations, require skilled husbandry. So much of the success or failure of a crop for an entire season and the resulting income for the farm family depend upon the proper selection of seed. Seeds, with their all-important germ plasm that contains all the bred-in characteristics of a particular kind or variety, are the basic foundation of the vast agricultural economy of America.

The objective of this booklet is to present agronomic facts and characteristics of the crops and varieties that are most generally used in the Upper Midwest. Some varieties have fairly general adaptation while others may be limited to smaller areas. The facts as presented here apply to the area of adaptation and performance may change when a crop or variety is taken from its area of adaptation. Northrup, King & Co. hopes this booklet will be useful in helping you make a wise decision in selection of crops and varieties for maximum production in your area.

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FORAGE LEGUMES

Alfalfa

Alfalfa, often called the "Queen of the forage crops," is the most valuable cultivated forage crop in the United States. It is grown to some extent in all of the states and is almost world-wide in distribution. History has recorded the use of alfalfa as a forage crop more than 500 years before the birth of Christ. Believed to have originated in southwest Asia, Roman writers recorded its introduction into the eastern Mediterranean area as early as 490 B.C. From there it spread west into Italy, Spain and other European countries. Early Spanish explorers carried alfalfa to Central and South America where it was cultivated for feeding the explorer's horses.

Early records show that alfalfa was first grown in the United States in Georgia, although early attempts to grow it in the Southeast and East met with little success. The first real success in the United States came when it was introduced from South America into the fertile limestone valley soils of California about 1851. From there it spread rapidly eastward into Utah, Kansas and other western and midwestern states. Alfalfa was never grown extensively in the North until after 1857 when Wendelin Grimm introduced a winterhardy type into Carver county, Minnesota. After several generations of natural selection under severe Minnesota conditions the Grimm type became the first alfalfa with variety distinction capable of successfully surviving northern winters.

Alfalfa is amazingly well adapted to a wide range of soil and climatic conditions. It is grown successfully from the short, cool Alaskan summers to the year-round growing seasons of Southern California and Mexico. Practically any climate is suitable for alfalfa where soils and moisture are suitable. It prefers deep, fertile, well drained soils and it uses large quantities of water in making a satisfactory crop. It requires large amounts of lime and does poorly on soils that are distinctly acid in reaction. While tolerant to alkaline soils, it does not do well on those that are highly alkaline. In addition to lime or calcium, the soil should be relatively high in phosphorus and potash for top production.

Uses of Alfalfa

The principal use of alfalfa is as feed for livestock. It is high in total digestible nutrients and is relished by all classes of livestock. It is a rich source of vitamins and minerals and is high in body building protein. In addition, alfalfa is a wonderful soil building crop. It may be used exclusively as a soil building crop or it can perform this important function while being utilized for forage. The principal uses of alfalfa are:

HAY—Alfalfa makes an excellent year-round roughage which produces additional gain and profit from the animals. Because of high nutritive value and palatability, alfalfa is considered the best roughage we have.

PASTURE—Alfalfa, when used in combination with grass, makes an excellent pasture. The total yield of nutrients is increased when alfalfa is sown with a

grass in a pasture. Alfalfa not only increases the feeding value of hay, but it also provides nitrogen for greater grass growth.

SILAGE—Alfalfa makes an excellent ensilage crop. One of the best ways to conserve and store the feeding value of alfalfa is to put the crop into the silo. This reduces carotene and leaf loss, and allows only for a small chemical change in the plant from the time it is cut until fed.

GREEN MANURE—Alfalfa makes an excellent green manure crop. Alfalfa increases the organic matter content of the soil, adds nitrogen and improves tilth. It fits well into crop rotations and increases yields of crops that follow.

ALFALFA MEAL—Alfalfa is used to produce large quantities of alfalfa meal. The plants are cut and cured in the field or dried artificially. After drying, the leaves are separated from the stems. The leaves are then ground into a high-protein feed called alfalfa meal.

Steps for Successful Establishment

1. Have soil test made six months before seeding. If lime is needed, apply in the fall before seeding.
2. Apply fertilizer at the rate recommended by the Soil Testing Laboratory.
3. Prepare a seed bed that is firm and clean. A fine, over-worked seed bed forms a crust in rainy or hot weather. Loose seed beds dry out rapidly and do not contain sufficient moisture for rapid germination.
4. Use Nodulated seed to insure healthy, vigorous stands.
5. Time of sowing alfalfa varies according to the prevailing conditions. Most of the alfalfa in the northern states is sown in the spring with a companion crop, although it may be successfully sown in late summer or early fall.
6. Seeding rates also vary considerably. The rate depends on climatic conditions, condition of the seed bed and method of seeding, as well as the fertility and moisture content of the soil. Normally, 12 to 18 pounds per acre are seeded for pure stands and 8 to 12 pounds per acre when used in mixtures with grasses.
7. Reduce the competition of the nurse crop by lowering the seeding rates of oats to 1 or 1½ bushels an acre or remove the small grain in the hay stage by grazing.
8. Seed may be broadcast and covered by rolling or harrowing. For most situations, a cultipacker seeder is the most efficient way to seed alfalfa and other small seeded grasses and legumes.

Management Tips

1. For greatest feed value per acre, cut alfalfa in the early bloom stage. When cut at this stage the plants are leafy, palatable and the protein content is high. Early cutting may give an extra cut per year without endangering the life of the stand. Later cuttings tend to be coarse and stemmy, less palatable and lower in feed value.
2. Alfalfa should be grown on fertile, well-drained soil. It needs liberal amounts of calcium, phosphate

ALFALFAS

Kind or Variety	Yield	Winter Hardiness	Recovery after cutting or grazing	Reaction to: *			Best use and type rotations
				Bacterial Wilt Disease	Common Leafspot Disease	Spotted Alfalfa Aphid	
919 Brand	High	Hardy	Medium	MR	S	S	Short and medium rotations hay and pasture
10-19 Brand	High	Very Hardy	Medium	VR	MS	S	Long rotations, pasture and hay
Terra Verde Brand	High	Non-Hardy	Fast	S	S	S	Green manure
Du Puits	High	Hardy	Fast	S	R	S	Short rotations hay and silage
Alfa	High	Hardy	Fast	S	S	S	Short rotations hay and silage
Atlantic	High	Hardy	Medium	S	S	S	Short rotations
Buffalo	High	Hardy	Medium	R	S	S	Long rotations hay and pasture
Cody	High	Hardy	Medium	R	S	R	New aphid resistant, hay and pasture
Cossack	Medium	Hardy	Medium	S	S	S	General purpose
Grimm	Medium	Hardy	Medium	S	S	S	General purpose
Ladak	High	Very Hardy	Medium	MR	S	S	Long rotations
Lahontan	Medium	Med. Hardy	Medium	R	S	R	Adapted to S.W. United States
Narragansett	High	Very Hardy	Slow	S	S	S	Short rotation hay and pasture
Nomad	Low	Med. Hardy	Slow	S	S	S	Range and pasture
Ranger	High	Hardy	Medium	R	S	S	Medium and long rotations hay and pasture
Rhizoma	Medium	Very Hardy	Medium	S	S	S	Short rotation
Socheville	High	Hardy	Fast	S	MS	S	Short rotations hay and silage
Teton		Very Hardy	Slow	R	R	S	New S.Dak. variety not fully evaluated
Vernal	High	Very Hardy	Medium	VR	MS	S	Long rotations pasture and hay
Williamsburg	Medium	Med. Hardy	Fast	S	S	S	Short rotations

*Reaction: R-resistant, S-susceptible, VR-very resistant, MR-moderately resistant, MS-moderately susceptible

and potash, along with minor amounts of boron. In the corn belt and Lake States, often as much as 200 to 500 pounds of commercial fertilizer are needed at the time of seeding. Alfalfa does not grow well on acid soil. For best results, the pH should be in the range of 6.5-7.0. After the last cutting each year, it is often advisable to top dress the stand with a fertilizer containing phosphate and potash. A reliable soil test best indicates the fertilizer requirements.

3. The danger of bloat can be reduced if about 50% of the pasture is grass. Have cattle well fed before turning them out on new alfalfa for the first time. Also keep an abundant supply of dry roughage available while they are grazing fields of succulent alfalfa.

4. Never cut for hay from about Sept. 1 until after the first heavy frost. This period allows the plants to build up a supply of food in the roots, which enables them to live over the winter and make recovery growth the following spring.

Red Clover

Red clover is the second most important forage legume grown in the corn belt and the northeastern quarter of the United States. It is best adapted to soil and moisture conditions typical of the corn belt and the Eastern states. While it is not as sensitive to acid soils as alfalfa, it does not tolerate drouth and heat near so well as alfalfa. In its area of adaptation red clover produces well under a wide range of soils. It gives satisfactory yields on soils of lower fertility, drainage is not as critical and it is more tolerant of improper management than alfalfa.

Red clover is well suited to use in hay and pasture mixtures. It makes nutritious and palatable hay, silage or pasture either when grown alone or in mixtures but it is best suited to growing in mixtures with grasses such as timothy, brome grass or orchard grass and with other legumes.

Red clover is actually a short-lived perennial but is generally treated as a biennial because diseases such as anthracnose and root rots reduce stands to such an extent that it is impractical to keep beyond the second winter. This limits its use to short rotations and mixtures. Because it is so widely adapted and fits so well into most farm rotations, red clover is a valuable forage and soil building legume throughout the Midwest.

Varieties and Types

Medium and mammoth types of red clover are both grown in the Midwest although the medium type is far more prevalent. Medium red clover is earlier in maturity and recovers quicker after cutting so that two cuts can be made in one season. Mammoth type is more popular as a soil improvement or green manure crop.

There are several strains and varieties of medium red clover that are grown in the Midwest. The types and varieties listed below are available in commercial quantities. Other named varieties are either poorly adapted, except for limited areas, or seed is not generally available in commercial quantities.

COMMON RED CLOVER a large quantity of red clover is produced in the North Central and Northern Intermountain states and sold as common red clover. This seed appears to be well adapted and generally yields quite well. Although not generally disease resistant, it has some tolerance to various diseases. Seed produced in the Northern Intermountain states, especially Idaho, is usually of superior quality. The seeds are larger, plumper and have a bright color. Most of the red clover grown is common red clover.

DOLLARD a new Canadian variety which yields well in the northern corn belt. Dollard has some resistance to northern anthracnose. It blooms slightly later than other strains but produces a good second crop and usually out-yields most varieties.

KENLAND a variety developed by the Kentucky Agricultural Experiment Station. It's composed of selected lines from Kentucky, Tennessee, Missouri and Virginia. It is resistant to southern anthracnose and somewhat more tolerant to some of the root rots but is susceptible to northern anthracnose. Kenland is an excellent variety for the southern and central corn belt areas, but is not recommended where northern anthracnose may be a problem. When this disease is present, yields may be less than with common red clover.

PENNSCOTT a relatively new variety selected by the Pennsylvania Agricultural Experiment Station. It has performed well in Pennsylvania, Michigan and surrounding areas but has not proven well adapted to other areas of the corn belt.

MAMMOTH RED CLOVER or "single-cut" clover is not as desirable for hay or pasture as medium red clover. It blooms about 10 days to 2 weeks later than medium red clover and recovers very slowly after cutting. For these reasons, only one hay crop may be harvested per season. In plant characteristics, Mammoth is larger and coarser than medium and tends to be more perennial in growth habit. Altaswede, a variety of Mammoth clover, has not proved superior to regular commercial Mammoth.

Sweet Clover

Sweet clover is one of the most efficient of all legumes as a soil building crop. A native to the temperate zones of Europe and Asia, it has been cultivated in the United States since the early 1700's. It is useful as a forage crop and is used extensively in some areas in pasture mixtures. However, its greatest use is as a soil improving crop and the biennial types are probably unsurpassed for efficiency in production of nitrogen and organic matter when permitted to grow to full maturity the second year after planting. A normal stand of sweet clover should add from 80 to 100 pounds of nitrogen per acre. It also adds large quantities of organic matter which improves soil tilth and structure.

Sweet clover will grow on most soils provided they are well supplied with lime. It is not tolerant of acid soils. One of the more drouth resistant legumes, it

does not do well on constantly wet soils or on soils with a high water table.

In spite of sweet clover's wonderful properties as a soil builder, it has some distinct disadvantages and has lost popularity with farmers for the past several years. First of all, epidemics of sweet clover weevil have often made it almost impossible to establish stands in some locations without an expensive spray program to control the insects. These pesky weevils continue to plague farmers trying to grow sweet clover in many areas. Livestock not accustomed to sweet clover find the odor and taste objectionable because of the high coumarin content. This coumarin is also responsible for "bleeding disease" in cattle if fed spoiled hay or silage. Probably the greatest objection to sweet clover is that it often becomes a "weed" in farmers' fields. Once it has been allowed to mature seed, as it often does in areas where it volunteers, the seeds can remain viable in the soil for 30 years or more. These seeds in the soil produce volunteer plants at irregular intervals and are generally considered as weeds.

Types and Varieties

There are two distinct types of sweet clover—the white blossom and yellow blossom. Most of the sweet clover grown in the United States is of the biennial type although there is some acreage of the annual white blossom type known as Hubam. There are a few named varieties commercially available although most of the seed is sold as Sweet Clover (white blossom) or as yellow blossom Sweet Clover. The following kinds of seed are commercially available in the Midwest.

EVERGREEN a very late maturing, biennial strain with white flowers. It is composed of several mass-selected strains. Development work was done at the Ohio Experiment Station.

HUBAM an annual white blossomed sweet clover which is very popular in areas where fall plowing is customary. It is less efficient than the biennial types as a nitrogen fixer but since it dies at the end of the season it presents no problem of eradication during fall plowing as all biennial types do.

MADRID a yellow flower, biennial variety which matures very early. It doesn't grow as tall as ordinary sweet clover and usually produces more forage and green manure tonnage than ordinary yellow and white blossomed clover.

ORDINARY

YELLOW BLOSSOM produces a smaller plant with finer growth which matures earlier than ordinary white blossomed sweet clover. Although it produces better quality hay, it is less desirable for pasture. It is about equal to common sweet clover for soil improvement and nitrogen fixation.

Other Clovers

ALSIKE CLOVER is actually a short-lived perennial although it usually behaves as a biennial. Alsike is winter-hardy and grows under a wide range of soil and moisture conditions.

It performs extremely well on wet, heavy soils but is not adapted to soils with drouth tendencies. Although it tolerates acid soils better than most clovers, it performs better on limed or near neutral soil. Its main use is on low, wet or sour land where other clovers don't usually do well. Alsike may be used with other legumes or grasses in mixtures for hay, pasture or silage.

WHITE CLOVER a short growing perennial used primarily in lawns. It is shallow-rooted and spreads by creeping branches (stolons) which root at the nodes. It grows best under cool, fertile, moist conditions. It is an aggressive creeper which produces a large number of seeds.

LADINO CLOVER a giant form of white clover which is very high in protein, vitamins and minerals. It is especially adapted to fertile and heavier soils which have a good moisture holding capacity. Ladino does not tolerate a wide range of soil and moisture conditions as ordinary white clover will. While moderately tolerant of acid soils, it performs best on well-limed soil. It is not adapted to soils with drouth tendencies. Ladino is a long-lived perennial which spreads by creeping stems or stolons that root at the nodes. It is an excellent legume to use in combination with other legumes and grasses. Ladino is difficult to mow and cure when grown alone and it also has a greater tendency to cause bloat than other clovers. It is a good producer of high quality feed and is utilized extensively as a soil building crop.



Ladino Clover — a perennial to be used in combination with other grasses.

Birdsfoot Trefoil

Birdsfoot Trefoil is becoming increasingly useful as grassland farming grows in importance in the corn belt area. Once established, Birdsfoot Trefoil is widely

adapted, easy to maintain and has certain advantages over alfalfa, ladino or red clover. It is more tolerant of infertile and acid soil, less likely to cause bloat and survives severe grazing better than most legumes. Birdsfoot Trefoil is a long-lived legume, highly palatable, with a high feed value. It is winter-hardy and is able to maintain itself in competition with most sod forming grasses. Because trefoil is slow in becoming established, it should usually be planted in combination with grasses such as timothy, bluegrass or orchardgrass. These grasses offer some growth and return while the trefoil is becoming established. Bromegrass should not normally be sown with trefoil before it is permanently established. Birdsfoot Trefoil's biggest drawback is its slowness in becoming established. It usually does not reach full maturity until the second or third year after planting.

There are three major species of Lotus or Birdsfoot Trefoil which are important in different parts of the United States. These are Big Trefoil or Lotus Major, Narrowleaf Trefoil or Lotus tenuis and Broadleaf Trefoil or Lotus corniculatus. The broadleaf is the latest blooming but is the most productive and winter hardy under northern conditions. Broadleaf is the only type recommended for use in the upper Midwest.

Many farmers have failed to obtain a stand because the seed was not properly planted or the stand poorly managed. Here are a few hints to help you get a successful stand.

1. Have the soil tested and apply fertilizer and lime at the recommended rate.
2. Be sure to use inoculated seed.
3. Prepare a good seed bed that is properly worked and very firm.
4. Seed at a uniform depth of $\frac{1}{4}$ - $\frac{1}{2}$ inch in the spring of the year.
5. Sow at the rate of 4-5 pounds of high quality seed per acre. If seeded on an old, worn out pasture, Kentucky bluegrass will usually volunteer without being sown. If seeded following a cultivated crop, plant one of the following grasses: 2 pounds timothy, 3 pounds orchardgrass or 3 pounds of Kentucky bluegrass.
6. After the seed is planted, firm the soil around the seed with a corrugated roller or cultipacker.

Types and Varieties

EMPIRE a selection of broadleaf trefoil which grows fairly prostrate. The plants are not as erect as imported European strains and bloom later. It is winter hardy but slower to recover after grazing. Empire is especially well suited to long rotation and permanent pasture use.

CASCADE, GRANDER AND VIKING are selections from European types made in Washington, Oregon and New York respectively. They are similar to Imported in growth habit. They are slightly earlier in maturity than Empire and are generally more productive especially when used for hay.

IMPORTED OR EUROPEAN is earlier in maturity and has an upright habit of growth. It is a good yielder when used for hay but does not persist in pastures as well as the Empire variety.

FORAGE GRASSES

Bromegrass

Smooth Bromegrass—one of the most remarkable of all forage grasses adapted to the Midwest. This drouth-defying, extremely winter-hardy grass gives excellent yields of high quality hay and pasturage. Bromegrass is especially well suited to growing with alfalfa in medium and long term hay and pasture mixtures. It has been the dependable standard forage grass for dairymen in the corn belt for many years.

Bromegrass is a leafy, sod-forming, long-lived perennial. It spreads rapidly by underground rhizomes or rootstocks to produce a dense sod. The root system is deep and extensive, accounting for its remarkable drouth resistance. The leafy plants usually grow to a height of 2 to 4 feet depending on the variety, soil and moisture. Unless seeded with a legume or unless fertilized adequately with nitrogen, older stands often become sod-bound and unproductive.

Bromegrass is widely adapted throughout the corn belt. Deep fertile loam soils are best for high production although it tolerates a wide range of soil and moisture conditions. Soils that are best for alfalfa growing are generally well suited to bromegrass. While extremely drouth resistant, it will also do well under excessive moisture conditions for limited periods. Because it requires abundant nitrogen it is best suited to growing with legumes.

Smooth bromegrass is excellent for either hay or pasture. It is one of the most palatable, nutritious, and productive grasses when used for either purpose. It is an ideal companion for alfalfa and also does well with red clover or ladino clover. It is slower to establish a productive stand than orchardgrass or timothy and probably should generally be planted in medium and long rotations where it will stay down for more than two years. It starts growth early in the spring and produces a heavy first cutting. Recovery after cutting or grazing is relatively slow and yields are lower in succeeding cuttings. Bromegrass is generally seeded at about 6 to 8 pounds with 8 to 10 pounds of alfalfa per acre.

There are several improved named varieties of bromegrass which generally fall into one of two types—Southern and Northern types. The Southern types are more vigorous and more productive in the corn belt. Lincoln, Fisher and Achenbach are all Southern types and are the most popular varieties. Canadian and Manchar are Northern types which are sometimes preferred in the Northern dairy areas.

Orchardgrass

Orchardgrass has been grown as a hay and pasture grass to a limited extent in the Midwest for many years. Recently there has been considerable new interest in this grass. It seems to be coming into a prominent place among other forage grasses as more farmers try it and see its advantages.

Orchardgrass is a tall-growing perennial bunch grass. It does not form a dense sod such as that formed by bromegrass and Kentucky bluegrass. It has a deep and extensive, fibrous root system that makes it tolerant to drouth and lower fertility soils. Orchardgrass makes an excellent early spring and

summer growth and recovers after the first cutting or grazing better than brome grass. It has good seedling vigor and stands are easy to establish. The immature leaves are palatable and nutritious, but if allowed to mature it becomes coarse and unpalatable to livestock. When cut early, orchardgrass compares very favorably with brome grass in feeding value.

Orchardgrass is grown to some extent in nearly every State in the Union. It has been most important in the eastern corn belt states and seems well adapted to the shorter type rotations typical of the corn belt. It grows well on a wide range of soil conditions and thrives under high summertime temperatures better than either brome grass or timothy. It does better on low to medium fertility soils than most grasses.

Orchardgrass has been used principally for pastures in mixtures with other grasses and legumes. However, when cut at the proper time it makes excellent quality hay or silage. Probably its greatest advantage over timothy and brome grass is its ability to recover after cutting or grazing with a second crop of forage better in quality than the first. This recovery is especially important when used for pasture as it gives more grass in the mixture and helps prevent bloat. It grows fairly well in late summer and into the fall when pastures are usually short. Grazing can begin on orchardgrass early in the spring as soon as it is growing vigorously. It should be grazed moderately heavy to maintain better quality and palatability as well as reduce competition to the legume. If livestock are unable to keep it eaten down, it should be clipped, as mature stalks become coarse, fibrous and unpalatable.

Orchardgrass is well adapted to seeding in mixtures with other grasses and legumes such as timothy, alfalfa, red clover, Ladino and Birdsfoot trefoil. When used this way a seeding rate of 5 to 8 pounds per acre is usually adequate.

There are a few named varieties of orchardgrass. However, most named varieties are either unavailable commercially or offer little advantage over ordinary kinds. Several breeding and improvement programs are under way at the present time.

Reed Canary Grass or Phalaris

This long grass thrives in wet, marshy lands where the water table is just below the surface at all times and even withstands occasional flooding. It is primarily a wet-land grass but grows exceptionally well on upland soils. In addition to making a good wet-land pasture or hay crop, Reed Canary Grass is also useful for waterways and pond banks. It can be seeded either in the spring or fall. In exceptionally wet areas it is usually a good idea to work the soil during the dry summer months and seed about the middle of August. If used for pasture, the grass should be grazed while it is young and succulent. When young, it is palatable and high in feeding value. When it becomes more mature, it is coarse and unpalatable. If used for hay, mow the first crop when 25 per cent of the plants are just beginning to bloom. The second crop does not head out but just stops growing. This should be cut for hay as soon as it stops producing additional leaves.

Timothy

Timothy is probably the oldest cultivated forage grass in the United States. Originally called Herd-

grass, the name timothy apparently came from Timothy Hanson who took the grass from New England to Maryland. The name was mentioned in a letter from Benjamin Franklin in 1747 and has apparently been known as timothy since that time.

Timothy is a relatively short-lived perennial bunch grass. It does not spread laterally by underground rhizomes to form a sod. The root system is relatively shallow and fibrous. The plants are erect, leafy and grow to a height of 2 to 3 feet. The base of the plants often become enlarged to form haplocorms—a storage place for carbohydrate reserves. The plants recover rather slowly after cutting or grazing and generally total yields are less than brome grass and orchardgrass.

Timothy grows well on heavy clay soils and is quite tolerant of acid soils. It is, of course, most productive on fertile soils but it also produces better crops than most grasses on soils of lower fertility. Because of its shallow root system, timothy is sensitive to inadequate moisture during the summer growing season.

The principal use of timothy is for hay when seeded in mixtures with clover or other legumes. In past years it was the premier hay crop for horses and mules and it is still prized as excellent hay for horses in many areas. It is very palatable to all classes of livestock as hay or pasture. Not having the tendency to get coarse and unpalatable with maturity the way orchardgrass does, it is preferred by livestock over orchardgrass and some others. It is best adapted to short rotations because of its short-lived habit of growth. There is little or no seed of improved named varieties adapted to the Midwest commercially available.

Bluegrass, Kentucky — Perennial. Native and very hardy throughout the corn belt. In many sections it is a natural pasture. It has a long dormant period in the summer and is not as productive as brome in pasture mixtures. Its primary value is for lawn purposes. Spreads by underground runners. Prefers rich soils.

Fescue, Alta Similar to meadow fescue but taller, coarser, more vigorous root system and is longer-lived. Alta is not as palatable as meadow fescue and is not generally as desirable for forage except in the south and Pacific Northwest where it has had better acceptance. It tends to become more stemmy and unpalatable as it reaches maturity. In the southern corn belt it has been used successfully in combination with alfalfa, Ladino and Birdsfoot trefoil.

Fescue, Meadow A winter-hardy short-lived perennial well adapted to pasture mixtures. It is more palatable than tall fescues such as Alta and Ky. 31. It stays green all season long and furnishes forage both in early spring and late fall. Meadow Fescue is well adapted to wet heavy soils. It is also valuable as a lawn grass.

Foxtail, Meadow (*Alopecurus Pratensis*). A highly palatable, long-lived, perennial grass, adapted to most soil types but thriving best on marshy, poorly drained land. Produces a fine quality hay and begins growth earlier in the spring than most other grasses.

Redtop — Perennial. This valuable grass has the ability to grow on a wider range of soils than any other grass. It will grow on moist land and on dry uplands. It is not palatable when allowed to mature and is valuable chiefly in pasture mixtures with other grasses and legumes. Spreads by underground runners. Also used in lawnseed mixtures.

Ryegrass, Common — Annual. Shiny, wide dark green leaf blades. Vigorous grower. Very competitive to other grasses. Adapted to both rich and poorer soils. Tends to bunch. Germinates in about 7 to 8 days, 230,000 seeds per pound. Used for pastures and lawns.

Ryegrass, Perennial Not winter hardy in northern part of the United States. Shiny, deep green, medium wide leaf blades. Adapted to fairly wide range of soils and soil conditions.

Wheat Grass, Crested A hardy, drought resistant, perennial bunch grass introduced from Russia. It has the ability to withstand extremely low temperatures and where moisture supplies are limited. Quite dormant during heat of midsummer. Very palatable to all classes of livestock. Can be sown spring or fall.

Sudangrass

This popular hay and pasture crop is native of tropical Africa and must be planted in warm soil. It may be sown as late as July or August but its season will be quite short. It is usually ready to pasture when 5 or 6 weeks old. Sudangrass grows remarkably well during the hot, dry weather of July and August. As a hay crop, sudan should be cut from the time the heads begin to appear until the seeds are in a soft dough stage. The best hay comes from early cuttings.

COMMON is the name given to ordinary commercial sudangrass as distinguished from the improved varieties. Common sudangrass is early in maturity and does not have the disease resistance of some improved varieties.

GREENLEAF, SUDAN a new variety released by the Kansas Experiment Station. It is late-maturing, leafy and disease resistant. Stems are juicy and the forage is sweet—suitable for hay, silage or summer pasture.

PIPER SUDAN is a new variety developed by the Wisconsin Experiment Station. It is more vigorous than common and generally yields better. Piper is resistant to leaf blight and anthracnose which results in both higher yields and quality when these diseases are prevalent. Its outstanding characteristic is that the potential hydrocyanic or prussic acid production is considerably lower. This reduces the danger of prussic acid poisoning in livestock. Piper has been an excellent seed producer.

SWEET SUDAN This variety, developed by the Texas Experiment Station, resulted from a cross between Leoti Sorghum and Common Sudangrass. It is very leafy, has a sweet, juicy

stem and is highly palatable. It is later in maturity than Common and Piper, and while it has some resistance to foliar diseases, it is not equal to Piper in this respect.

Millet

COMMON Fine stemmed and leafy with a close, compact head tapering slightly toward the upper end. The seed is yellow to straw color, oval to elliptical in outline and decidedly flattened on one side. This millet is characterized by a short season of growth, being one of the earliest Foxtail millets. Under favorable weather conditions will mature sufficiently for hay in 50 days.

EARLY FORTUNE (*Red Proso*). Beautiful red seed, two or three times the size of German millet. Heads in 25 to 35 days. Gives a large yield, both of seed and fodder. It can be fed to stock without injury, even when cut so late that the seed has formed. Seeds are smooth, heads are branching.

GERMAN Color of seed similar to common millet. Very sweet, palatable and when fed to dairy cows produces a large amount of milk. On good rich soil it grows 4 to 5 feet high. It is very tender if cut in full bloom. About three-fourths of a bushel of seed is sown to the acre. Yield, three to five tons of hay per acre.

HUNGARIAN Often called Hungarian grass. The hay is fine and excellent feeding value. Especially valuable because it requires such a short season to make a good crop. Frequently used as a catch crop.

JAPANESE Entirely distinct from all other millets. Grows 6 to 9 feet high, stands up remarkably well and yields enormous crops. When cured it makes good hay, superior in quality to corn fodder. Relished by all kinds of stock. May be sown broadcast, 15 pounds per acre, but it is better to sow in drills—12 to 18 inches apart—using 10 to 12 pounds to the acre. Does best on low, moist ground.

SIBERIAN Earlier than either German or Hungarian and consequently valuable for the North. Yields remarkably well. Extremely hardy, withstands drouth and is about two weeks earlier than German millet. Its tender leaves make excellent hay.

WHITE PROSO Same characteristics as other Proso millets but seed is larger. Used extensively for bird and poultry feed.

WHITE WONDER This variety has a heavy stem and broad leaves, very much like those of German millet; but the head is more compact, longer and slimmer. It yields well both in forage and seed but is more easily injured by dry weather than other well-known varieties.

YELLOW HOG (*Yellow Proso*). Makes inferior hay unless cut very young. Seed makes very fine feed for poultry and young chicks. Matures in about two months from planting time.

LEGUMES FOR HAY AND PASTURE (Midwest)

Crop	Annual or Perennial	Seeding rate Pounds per acre		Adaptation	General information
		Alone	In mixture		
Alfalfa	Perennial	10 to 15	3 to 12	Well-drained, well-limed soils of some depth. Will not stand excessive wetness or acid soils.	Excellent for both hay and pasture uses. Provides more summer forage than most legumes. New wilt-resistant varieties.
Alsike Clover	Perennial	6 to 10	1 to 5	Grows on sour soils better than many clovers. Likes moderate moisture, but succeeds on soils too wet for Red Clover.	Usually used where soils are too wet for Alfalfa or Red Clover. Combines well with other legumes and grasses for hay or pasture.
Birdsfoot Trefoil, Broadleaf	Perennial	4 to 8	2 to 4	Outstanding plant for thin, eroded soils. Grows on low-fertility soils and low-lime soils better than other legumes.	Stands heavy grazing and lasts long after other legumes have been eliminated. Drought-resistant yet well-adapted to wetlands.
Crimson Clover	Annual	12 to 20	2 to 10	Best adapted to the South, but is recommended in southern Indiana and Ohio.	An important winter pasture and soil improving crop where adapted. Becomes unpalatable at maturity.
Hubam Clover	Annual	10 to 12		Well-drained, well-limed soils best.	Not often used in pastures. Used as green manure.
Ladino Clover	Perennial	2 to 5	½ to 2	Fertile, well-drained soils. Stands some acidity but grows best on well-limed soils. Makes better growth on wet soils, than Red Clover or Alfalfa.	Outstanding clover for pastures. Very high-yielding and palatable. High in feeding value. Recovers quickly after grazing. Should be used wherever adapted. Excellent in pasture mixtures.

LEGUMES (Con't)

Lespedeza, Korean	Annual	20 to 25	4 to 15	Best adapted to thin acid soils in southern Cornbelt. More drouth-resistant in early growth than Alfalfa.	Used in pasture mixtures or seeded alone. Hay quality depends on soil fertility and time of cutting.
Red Clover, Medium	Short-lived Perennial	8 to 12	3 to 8	Moist, well-drained, reasonably fertile soils best. Stands some acidity but not below pH 5.6. Not adapted to either very wet or dry soils.	Excellent for both rotation and permanent pastures. Usually lasts two years in pastures but produces heavily while other plants are getting started.
Red Clover, Mammoth	Short-lived Perennial	8 to 12	3 to 8	Similar to Medium Red Clover but somewhat better adapted to poor soils.	Used primarily for soil improvement. Somewhat coarser and about two weeks later than Medium Red Clover. Makes but one crop in the North.
Sweetclover	Biennial	10 to 12	4 to 8	Well-drained, well-limed soils of some depth. Has higher lime requirements than even Alfalfa.	Best adapted to short-term pastures. First-year yields lighter than second year.
Sweetclover, Yellow Blossom	Biennial	10 to 15	4 to 8	Similar to white blossom Sweetclover, but is somewhat more drouth-resistant.	Most varieties leafier, shorter, and finer stemmed but somewhat less productive than above. Used where drouth or weeds are a problem.
White Clover	Perennial	3 to 5	1 to 3	Succeeds on shallow soils if they hold moisture well. Stands more drouth and wetness than Ladino. Lime essential for best growth.	Not as productive as Ladino Clover, but better adapted to poorer soils. Not suited to hay uses because of low-growing habit.

Outstanding Products
of
SEED RESEARCH
from
NORTHROP KING

NK Alfalfas for 1960

NK Corn Hybrids for 1960

NK Sorghum Hybrids for 1960



RESEARCH

in the seed industry, as

in any major industry, promises progress and improvement. It means built-in benefits for you, new features, plusses and extras that give you more for your money. It means great advances that make your work easier and your time more valuable.

Newer, more valuable crops; surer, safer harvests; and bigger yields at less expense are the actual results of research at Northrup King—and these are the goals of the future.



The outstanding *seed products* described on the next 9 pages are all developments of Northrup King research. Each of them has behind it years of research and testing by NK's own agronomists, in laboratories, breeding grounds and trial farms across the nation.



Northrup King's research program is the most extensive of any seed company in the United States. What does this mean to you?

Just this: that the Northrup King *seed products* you buy—whether alfalfa, hybrid corn or hybrid sorghum—have proven performance behind them. Proven in every test that can be devised before they are ever released for sale—proven after that on farm after farm after farm across the nation. You'll find that these NK seed products will help you *get more from every acre.*



ALFALFA

It's good farm management to plant one or more of Northrup King's definite purpose alfalfas on your farm. Each is a farm-proven product to serve your *specific* alfalfa needs . . . give you the best possible hay, forage or green manure returns. They can boost your yields *and* your profits. For Northrup King Alfalfas have behind them more research, more testing, more processing than any other alfalfa seed on the market. They are planted on more farm acres than any other branded alfalfa seed products.

And now, in a revolutionary breakthrough in seed research, Northrup King can supply you with all of its main brands **NOCULIZED**, already inoculated and ready to plant.

NOCULIZED SEED

Trade Mark

This is a new process. You can now get seed already inoculated and ready to plant. Live, nitrogen-fixing bacteria are inside the seed when you buy it! And they stay inoculated for a whole season.

NOCULIZED seed plants easily, accurately. No sticking, skipping or lumpiness as often happens with seed inoculated by conventional methods or with coated inoculants.

The main advantage, of course, is that it saves you time . . . eliminates the mess and muss of mixing seed and bacteria by hand.

Proven on over $\frac{3}{4}$ million farm acres, Noculized seed is a sure method of inoculating seeds for better stands, nitrogen build-up, plant protein increases and better plant growth.

WES GRO PROCESSED

Another process applied to Northrup King's main alfalfa seed products is Wes Gro—developed to reduce the hard seed content to a minimum. It makes for faster, more even germination and uniform, better stands.

Modern farm management calls for

Northrup King "Definitive"

919 BRAND

for 4 out of 5 alfalfa fields

Over 80% of all farmers planting alfalfa normally leave it in for 3 or less hay years, a recent survey shows. For these farmers, 919 Brand is the ideal general purpose seed product to plant. 919 produces thick stands of leafy, fine-stemmed plants that make top-quality hay or pasture. 4 out of 5 farmers who've tried it say it yields as well or better than other alfalfas they've grown. It has more resistance to crop-destroying diseases than ordinary alfalfas. And it has high guaranteed purity and germination.



TERRA VERDE BRAND

for plow-down green manure

It gives you *maximum* green manure benefits. It adds nitrogen, organic matter and improves tilth. A blend of selected, fast-growing, non-hardy alfalfa strains specially designed for plow-down use, it can increase your soil's nitrogen content by 80 lbs. per acre or more. Its deep roots help improve internal soil drainage—breaks up hard pan. It can be seeded with a companion small-grain cash crop *and* increases yields of crops that follow (such as corn) by 5 to 15 bushels per acre. Only the genuine Terra Verde Brand has 5% green-stained seed.



**r one or more of these
urpose'' Alfalfas**

10-19 BRAND

Disease resistant, long-lived

Specially developed to give you *higher yields* of hay and pasture for a longer time (3 years or more). It's highly wilt-resistant . . . it's proven winter hardy, Northern-adapted. 10-19 Brand resists trampling and grazing better than most alfalfas. It has higher guaranteed purity and germination than consistently prevail on other brands of ordinary alfalfa seeds. All seed in 10-19 Brand is of known pedigree.



DU PUIITS ALFALFA

for extra-high yields under intensive management

The highest-yielding, most productive, winter-hardy alfalfa you can grow for short rotation under intensive management. Usually gives you one *extra* cutting a year—higher yields. Starts growth earlier in the spring, usually reaches cutting stage a week to 10 days ahead of other varieties, recovers faster after cutting, and grows later into the fall. Du Puits has large, leafy plants. It holds onto its leaves at haying time—makes top-quality hay. Has greater leaf-spot disease resistance than ordinary alfalfas.



HYBRID CORN

With the help of this chart you'll be able to select several of these Northrup King hybrids adapted to your farm.



NORTHRUP KING HYBRID CORN COMPARATIVE CHART

	Relative Maturity	Drying Characteristics	Ear Type	Plant Height	Ear Placement	Shank Length	Shelling Per Cent	Stalk Quality	Outstanding Characteristic
KN2	Earliest Hybrid	Fast	Med. small	Med. short	Med. low	Medium	V. good	Fair	Early
KF	2 days later than KN2	V. fast	Slender Semi-dent	Like KN2	Med. low	Medium	Med. good	Good	Vig. spring growth
KE3	Like KF	V. fast	Med. slender Small Cob	9" taller than KF	Medium	Med. short	Outstanding	Excellent	Standability
KC3	Like KE3	V. fast	More blocky than KE3	Like KE3	Medium	Medium	Excellent	Excellent	Yield. Fast drying
KE2	5 days later than KC3	V. fast	Long slender	6" taller than KC3	Medium	Med. long	Outstanding	Good	Fast drying
KE7	2 days later than KE2	Fast	More blocky than KE2	6" taller than KE2	Med. high	Short	Excellent	Excellent	Standability
KE1	3 days later than KE7	V. fast	Long, slender like KE2	Like KE7	Medium	Med. long	Outstanding	Med. good	Shelling %. Drying
KC6	1 day later than KE1	Fast	Blockier than KE1	Like KE1	Medium	Med. long	Excellent	Good	Yield. Drying
KA3	2 days later than KC6	V. fast	Med. long Semi-blocky	6" taller than KC6	Medium	Medium	Excellent	Good	Yield. Drying
KA4	2 days later than KA3	Med. fast	Med. long slender	Like KA3	Medium	Med. short	Excellent	Good	Good shelling %
KS2	2 days later than KA4	V. fast	Semi-long Semi-blocky	4" taller than KA4	Med. low	Med. long	Outstanding	Excellent	Yield
KS3	1 day later than KS2	Med. fast	Med. long	Like KS2	Medium	Short	Outstanding	Outstanding	Standability. Yield
KS4	2 days later than KS3	Fast	Med. long Semi-blocky	Like KS3	Medium	Medium	Outstanding	Outstanding	Yield. Standability
KB4	Like KS4	V. fast	Med. long Very blocky	Like KS4	Medium	Med. long	Good	Good	Yield. Drying
KS5	2 days later than KB4	Fast	Med. long Semi-blocky	Like KB4	Medium	Medium	Outstanding	Excellent	Adaptability. Yield
KS6	1 day later than KS5	Fast	Long slender	Like KS5	Medium	Medium	Outstanding	V. good	Adaptability
KL	Like KS6	V. fast	Med. slender	Like KS6	Medium	Medium	Excellent	Good	Fast drying. High shellout
M2	2 days later than KL	Fast	Long slender	Taller than KS6	Medium	Med. long	Good	Recommended for silage	Silage corn
KO5	2 days later than M2	V. fast	Slender	Taller than KO4	Medium	Med. long	Excellent	Very good	Fast drying. Dual purpose
KO4	1 day later than KO5	Moderately slow	Blocky	Medium short	Med. low	Short	Outstanding	Excellent	High shelling %. Short plant

HYBRID CORN CHART (continued)

	Relative Maturity	Drying Char- acteristics	Ear Type	Plant Height
KT	Like KO4	V. fast	Longer and more slender than KO4	1" taller than KO4
KT1	1 day later than KT	Fast	More blocky than KT	Shorter than KT
KT2	3 days later than KT	Med. fast	Length of KT. More diam.	Like KT
KT5	1 day later than KT2	Medium	Blocky like KO4	1" shorter than KT2
KT6	1 day later than KT 5	Fast	Like KT5. Longer. Slender	Like KT2
KT7	3 days later than KT6	Medium	KT6 length. KT5 diam.	8-12" taller than KT6
KT9	3 days later than KT7	Medium	Similar to KT6. Larger	Like KT7

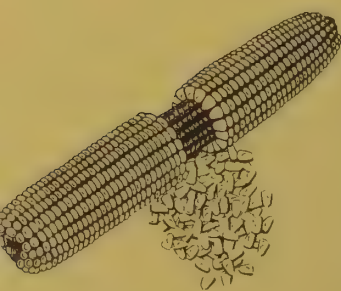
GET MORE FROM

Northrup King corn hybrids are bred, tested and produced with one thought in mind . . . to give you the best yields your land, moisture conditions and planting rate can produce.

In the development of each hybrid, two specific factors are always of first importance to Northrup King corn breeders—and no hybrid is ever released until it passes the test on both counts.

What are they?

1 ABILITY TO PRODUCE



A hybrid has to be a producer. It has to yield right up there with the best of them—and better. Every NK hybrid does—because it's bred to have longer ears, more diameter and deeper kernels. These are

Ear Placement	Shank Length	Shelling Per Cent	Stalk Quality	Outstanding Characteristic
1" higher than KO4	Long	Excellent	Excellent	Fast drying. Wide adaptability. Dual purpose
Medium	Medium	Excellent	Excellent	Fast drying
Same as KT	Medium	Excellent	V. good	Spring vigor. Dual purpose
6" lower than KT2	Med. short	Outstanding	V. good	Short plant. High shelling %
6" higher than KT 5	Medium	Excellent	Excellent	Wide adaptability. Fast drying
4-6" higher than KT6	Medium	Outstanding	Excellent	High shelling %. Standability
Higher than KT7	Med. short	Excellent	Excellent	Standability. Spring vigor

EVERY ACRE

the three main factors that remain foremost in NK's corn *breeding* program.

2 HARVESTABILITY



But yield doesn't mean a thing until your corn is safely in your crib or silo. That's why all NK hybrids have vigorous plants, strong stalks, husky shanks, deep roots—all for one purpose: to keep that golden, grain-loaded ear up there where you can harvest it safely.

You can count on Kingscrot to come through for you—year in and year out, both good seasons and bad, in dry weather or wet.

HYBRID SORGHUM

All exclusively bred by NK for

Here are NEW sorghum hybrids adapted to and for the midwest. Developed by Northrup King plant breeders at NK seed Research Farms and farm tested in trials across the United States.

Included are the earliest grain and forage sorghum hybrids available. With these earlier, higher-yielding sorghum hybrids developed through Northrup King research, you can now turn a bigger profit on this crop. Ask your Northrup King dealer to help you select the proper hybrids for your use and your farm.

NEW! X-3000 Experimental. This one has tremendous potential! It's the *earliest* of all sorghum hybrids. The short, compact stalk and excellent head exertion make for easy, clean combining. It has out-yielded open-pollinated varieties of even somewhat later maturity by 40% to 50% in college and Northrup King trials. It's about 5 days earlier than NK 135 or RS 501—can be grown successfully as far north as North Dakota! Earliness and high yields make this variety one of the country's most outstanding sorghums.

NK 135 Grain. Here's another early grain sorghum hybrid. Has a loose, open, quick-drying head, excellent head exertion and combines easily and clean. Harvested seed is bright red. Often yields 5% to 10% more than RS 501, often twice as much as Norghum and Reliance. A full season hybrid throughout northern areas.

NK 140 Grain. For a really uniform field you'll want to try this one. It's shorter than NK 135 and slightly later, but about 6 days earlier than RS 590. Heads are semi-loose, fast-drying and easy to combine. Adapted to all areas where RS 590 is grown, this one has kicked out up to 15% greater yields than RS 590

highest yields



and up to 50% more than Redbine 60. Best under irrigation or otherwise good moisture conditions.

NK 145 Forage. A top-notch yielder that's probably also the earliest forage hybrid on the market today. NK 145 has yielded over 25 tons on a single cutting, and its high grain content makes it an excellent green chop feed as well as silage. Also excellent for pasture. Plants stand 6 to 7 feet tall, fine-stemmed, very leafy with lots of tillers. Stalks are juicy and semi-sweet. Heads are large, loose and open.

NK 210 Grain. Here's the medium maturity grain hybrid to replace Martin, Midland or RS 610 in the southern 2/3 of the Midwest. If in doubt, grow NK 210. It looks a lot like RS 610, but has consistently out-yielded it. Reason is semi-loose heads are bigger, longer. Head exertion is excellent. Very widely adapted.

NK 230 Grain. If lodging or bird damage is a problem in your area, this grain hybrid is for you. Its maturity is similar to RS 650 or Plainsman, and it should be grown in the same areas. Plants are short, stocky, with excellent standability. Head exertion is good and heads are unusually long. Tests at many locations prove it to be an outstanding yielder.

NK 300 Grain or Forage. A dual-purpose hybrid that consistently gives top yields. Adapted wherever Atlas is recommended, it produces good grain yields and has produced over 30 tons of green chop in one cutting. Plant has wide, thick leaves with good sugar content and juiciness, and profuse tillers. Exceptional stalk quality and root strength give NK 300 the ability to stand when other forage varieties go down.

How Northrup King nation-wide research and testing of NK products help you get more from every acre



CODE:

- ▲ Areas in which Northrup King strip plots are located.
- Areas in which Northrup King replicated yield trials are located.
- Areas in which college tests of Northrup King products are conducted.

The map above shows Northrup King's nation-wide system of *product* research, breeding, and testing. Northrup King has, in fact, a wider scope of research activity on *ALL SEEDS*—especially hybrid corn seed, hybrid sorghum seed, alfalfa seed—than any other general seed house in the world.

No product of Northrup King Seed Research is ever released for sale until it has passed the most exhaustive series of tests possible to apply against it. From the most advanced seedcleaning machinery for alfalfa to the most accurate grading of hybrid seed corn or the most careful possible rogueing of hybrid sorghum fields—*every* possible precaution is taken to see that whatever NK *branded seed product* you buy, it is the best obtainable. It's your assurance that Northrup King seeds *will* help you get more from every acre.

FEEDING VALUE OF DIFFERENT HAYS

	Water	Ash	Protein	Crude Fiber	Nitrogen Free Extract	Ether Extract (fat)
Mixed Grasses	15.3	5.5	7.4	27.2	42.1	2.5
Timothy	13.2	4.4	5.9	29.0	45.0	2.5
Orchardgrass	9.9	6.0	8.1	32.4	41.0	2.6
Redtop	8.0	5.2	7.9	28.6	47.5	1.9
Kentucky Blue-grass	21.2	6.3	7.8	23.0	37.8	3.9
Meadow Fescue	20.0	6.8	7.0	25.9	38.4	2.7
Perennial Rye-grass	14.0	7.9	10.1	25.4	40.5	2.1
Mixed Grasses and Clovers.....	12.9	5.5	10.1	27.6	41.5	2.6
Barley, cut in milk	15.0	4.2	8.8	24.7	44.9	2.4
Oats, cut in milk	14.0	5.7	8.9	27.4	41.2	2.8
Red Clover Medium	15.3	6.2	12.3	24.8	38.1	3.3
Red Clover, Mammoth	21.2	6.1	10.7	24.5	33.6	3.9
Alsike Clover.....	9.7	8.3	12.8	25.6	40.7	2.9
White Dutch Clover	9.7	8.3	15.7	24.1	39.3	2.9
Crimson Clover	9.6	8.6	15.2	27.2	36.6	2.8
Lespedeza	11.0	8.5	13.8	24.0	39.0	3.7
Alfalfa	8.4	7.4	14.3	25.0	42.7	2.2
White Sweet Clover	22.1	6.5	11.6	24.2	33.2	2.4
Cowpeas	10.5	14.2	8.9	21.2	42.6	2.6
Soybean	11.8	7.0	14.9	24.2	37.8	4.3
Pea Vine	15.0	6.7	13.7	24.7	37.6	2.3
Vetch	11.3	7.9	17.0	25.4	36.1	2.3

GRASSES FOR HAY AND PASTURE (Midwest)

Crop	Annual or Perennial	Seeding rate Pounds per acre		Adaptation	General information
		Alone	In mixture		
Bluegrass, Kentucky	Perennial	20 to 30	8 to 20	Widely adapted, but grows best on fertile, well-drained, well-limed soils.	Not often seeded in pastures because of its widespread occurrence. Used mainly for turf purposes.
Bromegrass, Smooth	Perennial	10 to 15	4 to 12	Deep, fertile, well-drained loams are best. Grows well on lighter soils if well supplied with nitrogen. One of the more drouth-resistant grasses.	Generally seeded along with a legume—usually Alfalfa. Northern-type Bromegrass produces less vigorous rootstocks than southern-type Bromegrass and is less likely to become sodbound.
Fescue, Alta	Perennial	10 to 15	4 to 10	Prefers moist, heavy, fertile soils but does better on poorer soils than most grasses. Tolerant of both extreme wetness and dryness.	A very productive, rugged grass. Rather new in the Cornbelt and Lake States but has shown considerable promise, especially in the Cornbelt.
Fescue, Kentucky 31	Perennial	10 to 15	4 to 10	Similar to Alta Fescue in all respects.	Developed in Kentucky.
Fescue, Meadow	Perennial	10 to 15	4 to 10	Prefers moist heavy soils. Best adapted to wetter lands.	Not as productive, but somewhat more palatable than Alta or Kentucky 31.
Foxtail, Meadow	Perennial	10 to 12	4 to 10	Best adapted to mucks and peats, but does well on clays and loams. Does best on wet, marshy lands.	Excellent grass for wetlands. Highly palatable and nutritious. Starts growing earlier in the spring than most grasses.
Orchard Grass	Perennial	10 to 12	4 to 8	Grows best on moist, fertile soils but better than many grasses on poor, somewhat acid soils.	More drouth-tolerant than Timothy or Bromegrass and makes more summer growth than these grasses. Quick to establish.

Redtop	Perennial	8 to 12	2 to 4	One of the best grasses for thin, drouthy, infertile soils. Also well-adapted to wetlands.	Valued more for its ability to succeed under trying situations than for its forage value.
Reed Canary Grass	Perennial	4 to 8	4 to 8	Does well on most soils provided they are wet enough. One of the best grasses for wet, marshy lands.	Most often used for seeding wet lowlands. Slow to establish but eventually produces a firm sod. Excellent for either hay or pasture, if properly managed.
Ryegrass, Common (Italian)	Annual	25 to 30	8 to 20	Any reasonably good soil. Not too tolerant of acidity.	Not winter-hardy. Should be used only in annual pastures.
Ryegrass, Perennial	Short-lived Perennial	25 to 30	8 to 20	Any reasonably good soil. Not too tolerant of acidity.	Same as above. Not winter-hardy in northern part of United States.
Sudan Grass	Annual	15 to 30		Deep, fertile soils best, but succeeds on most soils provided they are not too wet, cold, or acid.	The best grass for summer annual pastures. Used for hay or pasture. Drouth-resistant when once established.
Tall Meadow Oatgrass	Perennial	15 to 20	2 to 8	Widely adapted but especially well-suited to sandy or gravelly soils. Prefers well-drained sites.	Not widely used but is a good hay and pasture grass where adapted. Stock must become accustomed to peculiar taste.
Timothy	Perennial	8 to 12	2 to 10	Best on moist, but well-drained clay loams. Prefers fertile soils but makes good growth on lower fertility soils. Not drouth-resistant.	The most popular grass—excellent for hay or pasture. Usually does not remain productive in pastures beyond two years.
Wheatgrass, Crested	Perennial	10 to 12	4 to 8	Very tolerant of drouthy soils. Grown mostly in the Dakotas and Intermountain areas. Does best on fertile loam soils.	Very hardy and long lived. Used on western ranges and in mixtures with alfalfa. Very palatable to all kinds of livestock.

MISCELLANEOUS FIELD CROPS

CANE, ATLAS is a high-yielding, late-maturing variety suitable for central and southern Iowa, Nebraska and similar areas. It has tall, strong stalks that resist lodging. The seeds are white and are similar to grain sorghums in feeding value. Axtell is a selection from Atlas that is about a week earlier and somewhat shorter but otherwise almost identical.

CANE, BLACK AMBER an early variety of sorghum cane which has been very popular for years. Seed is light brown in shiny black hulls. Stalks are slender, juicy and sweet with few leaves. Height runs 6 to 9 feet. Matures in 90 to 100 days.

CANE, RANCHER an early low acid selection from Black Amber. It is well adapted to cool, short season conditions and is a good variety for late planting in longer season areas.

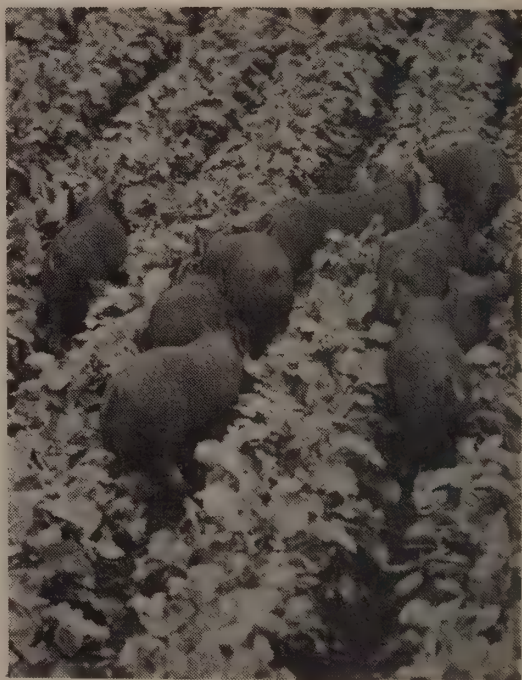
CANE, WACONIA ORANGE SORGHUM An early variety developed by careful selection for high yield of sorghum. Matures in Minnesota climate and is a heavy yielder of forage. Used for sorghum and stock feed.

CANADA

YELLOW FIELD PEAS Satisfactory for forage. When mature, seed is suitable for livestock feed. Vine height 3½ to 4 feet. Pea is small, smooth and cream colored.

DWARF ESSEX RAPE

An annual resembling rutabaga in leaf and stalk, but both leaves and stalks are taller and more numerous. A forage plant which may be eaten by any kind of livestock, it is especially adapted for cattle and swine. A good crop will furnish at least 12 tons of green feed an acre. Thrives best on good soil, rich in vegetable matter. Slough lands are excellent. Sow broadcast, 5 pounds an acre. Sow 1 to 2 pounds an acre in rows 30 inches apart for proper cultivation.



Rape is nourishing for hogs.

WINTER OR HAIRY VETCH A hardy winter annual which can be planted in the fall or in the spring. While it prefers good soil, it will do better on sandy soil than most other legumes.

Buckwheat

JAPANESE Buckwheat remains in bloom for a considerable period and produces seed early. Therefore it can be grown farther North. Resists drouth and blight very well. Seed is rich dark brown in color.

SILVER HULL It is early and remains longer in bloom than other varieties. A fine variety for honey bees. Grain has a beautiful light gray color and a thin husk.

Speltz —a dry-land grain introduced from Russia. A species of drouth-resisting wheat not inclined to rust and retains its glumes when threshed. Thrives on poor land, prairie regions, and in stony ground. Yields heavier than oats or barley. Sow 70 to 80 pounds per acre.

GRAINS

Oats

A Popular Small Grain for Corn Belt Crop Rotation

Ranking second only to corn as a feed grain crop in the North Central states, oats is the most widely grown of all the small grain crops. Beside its use as an excellent livestock feed fairly rich in protein, it finds its way to the family table in many processed forms.

Oats are tolerant to a wide range of soil and moisture conditions and may be grown under various cultural practices. They fit particularly well into crop rotation plans in the corn belt. They are ideal following corn and can be used as a companion crop for small seeded legumes and grasses.

Oats also make an excellent companion crop to legumes seeded for green manure purposes. They should not follow legumes in rotation, however. Excess nitrogen left in the soil by legumes may cause lodging.

Livestock farmers know the value of oat straw, often overlooked as a rather invaluable by-product. It is fairly nutritious and in an emergency can be used as a roughage. Oat straw makes excellent bedding and can be used in constructing economical livestock shelters.

Tips on Planting

Plow or disk for a satisfactory seedbed. In northern areas where winter erosion is not a problem, fall plowing is best. In some areas such as northern Iowa and Illinois, the common practice is to prepare the seedbed by thoroughly disking corn land in the spring.

Seed early in spring as soon as field and moisture conditions permit. Early seeding helps avoid hot weather at flowering time. Hot weather often affects late plantings and causes poor fill and reduces yield.

Either grain drills or end-gate seeders are used for planting. Although end-gate seeders are satisfactory and in general use in some areas, the drill provides the advantage of having attachments for fertilizing and companion crop planting.

Seeding rates range from 2 to 3 bushels an acre, depending on the type of seeders and soil conditions. About 1½ to 2 bushels an acre is adequate when seeding as a companion crop in pasture establishment or renovation.

OAT VARIETIES

Variety	Yield	Maturity	Plant Height	Lodging Resist.	Seed Color	Seed Size	Seed Weight	Disease Reaction *				Main Areas Where Grown	Remarks
								Stem	Rust	Races	Crown		
								7	7A	8	Rust		
Ajax	High	Med.	Tall	Med.	White	Med.	Med.	R	R	S	S	S.D., Ind., Mich., Minn., N.D., Wis.	
Andrew	Med.	Early	Med.	Good	Yellow	Med.	Med.	R	R	S	S	Minn., N.D., S.D., Wis., Neb., Iowa	
Beedee	Med.	Med.	Med.	Med.	Brownish	Large	Med.	R	R	S	MS	Wis., Iowa, Ill., Minn., Mich.	
Bentland	Med.	Med.	Med.	Med.	Yellow	Med.	Med.	S	S	R	R	Indiana	
Bonham	Med.	Early	Short	Med.	Ivory	Large	Med.	S	S	R	S	Iowa, Minn., Mich., Wis.	
Branch	High	Late	Tall	Fair	White	Med.	Med.	R	R	S	MS	Wis., Minn., Ill., Mich.	
Brunker	Med.	Early	Med.	Poor	Brownish	Med.	Low	S	S	-	S	Nebraska	
Burnett	High	Med.	Med.	Good	Yel.-Wht.	Large	High	R	S	R	MS	Iowa, Ill., Minn., Wis.	
Cherokee	Med.	Early	Short	Med.	Ivory	Large	Med.	S	S	R	S	Iowa, Neb.	
Clarion	Med.	Med.	Med.	Med.	Yellow	Large	High	R	R	S	S	Iowa, Ill., Ohio, Ind.	
Clintafe	Low	Med.	Med.	Good	Yellow	Small	Med.	S	S	R	R	Indiana	
Clintonland	Med.	Med.	Med.	Good	Yellow	Med.	High	S	S	R	R	Upper Midwest	
Clintonland 60	Med.	Early	Med.	Good	Yellow	Large	High	R	S	R	R	Ind., Ill., Iowa	New Variety
Eaton	Med.	Med.	Med.	Good	White			S	S	R	S	Michigan	

Fayette	Low	Early	Short	Med.	Yellow	Large	Med.	R	R	S	R	Wisconsin	
Garry	High	Late	Tall	Good	Yel.-Wht.	Large	Med.	R	R	R	MS	Upper Midwest	
Goodfield	Med.	Early	Short	Good	Yellow		High	R	R	RR	R	Wisconsin	New Wis. Variety
Jackson	Med.	Med.	Med.	Good	Yellow	Med.	Med.	R	R	S	S	Mich., Neb.	
Logan	Med.	Med.	Med.	Med.	Brownish	Med.	Med.	R	R	S	S	Illinois	
Marion	Med.	Med.	Med.	Med.	Yellow	Med.	Med.	R	S	S	MS	N.D., S.D., Neb.	
Minhafer	Med.	Early	Med.	Good	Yellow	Large	High	R	R	R	R	Upper Midwest	
Minton	High	Med.	Med.	Good	Yellow		Low	R	S	R	R	Minnesota	New Minn. Variety
Mo 0-205	Med.	Med.	Med.	Med.	Gray-Red	Small	High	R	R	S	MS	Neb., Iowa	
Nehawka	Med.	Early	Short	Good	Ivory	Large	Med.	R	R	S	MR	Nebraska	New Neb. Variety
Nemaha	Med.	Early	Short	Med.	Ivory	Large	Med.	S	S	R	S	Upper Midwest	
Newton	Med.	Med.	Med.	Good	Brownish	Large	Med.	R	R	S	MS	Iowa, Ind., Ill.	
Putnam	Med.	Early	Short	Med.	Brownish	Large	High	S	S	R	S	Ind., Ill., Ohio	
Ransom	Med.	Early	Med.	Good	Yellow	Med.	Med.	R	R	R	MS	N.D., S.D., Minn.	
Rodney	High	Late	Tall	Good	Yel.-Wht.	Large	High	R	S	R	MS	Upper Midwest	
Sauk	High	Late	Tall	Med.	Yellow	Large	Med.	R	R	S	MS	Upper Midwest	
Scotian	High	Late	Tall	Med.	Yel.-Wht.	Large	Med.	R	R	S	S		Canadian Variety
Shield	High	Early	Med.	Good	Yel.-Wht.	Med.	Med.	R	R	S	S		New Can. Variety
Simcoe	High	Med.	Tall	Med.	Yel.-Wht.	Large	Med.	R	R	S	S	N.D., Mich.	
Waubay	Med.	Med.	Med.	Good	Yellow	Large	High	R	R	S	S	S.D., Minn., Iowa, Ill.	

*Disease Reaction: R—resistant, S—susceptible, MR—moderately resistant, MS—moderately susceptible

SOYBEAN VARIETIES

Variety	Yield	Maturity	Plant Height	Lodging Resistance	Seed Size	Oil Content	Areas Where Adapted
Acme	Medium	Very early	Short	Good	Medium	High	N.D., N Minn.
Adams	High	Med. late	Tall	Good	Medium	High	Neb., S Iowa, C Ill., SE S.Dak.
Blackhawk	High	Medium	Tall	Good	Medium	High	S.D., S Minn., Wis., N Ill., Ind., Ohio, Mich.
Capital	High	Early	Medium	Good	Small	High	N.D., Minn.
Chippewa	High	Med. early	Med. tall	V. good	Medium	High	S.D., Minn., Wis., N Iowa, N Ill., N Ohio, Mich.
Clark	High	Late	Tall	V. good	Medium	High	S Neb., S Iowa., Ill.
Crest		Very early	Medium		Medium		N.D., N Minn.
Comet	High	Early	Med. tall	Good	Medium	High	N.D., Minn.
Flambeau	Medium	Very early	Short	Medium	Medium	Medium	N.D., Minn., Wis.
Ford	High	Med. late	Tall	V. good	Medium	High	Neb., Iowa, Ind., Ill., Ohio
Grant	High	Early	Medium	Good	Medium	High	N.D., S.D., Minn.
Harosoy	High	Medium	Tall	Fair	Large	Medium	S Minn., S.D., Neb., Iowa, Wis., Ill., Mich., Ind., Ohio
Hawkeye	High	Medium	Tall	Good	Large	High	S.D., Neb., Iowa, S Wis., Ill., Mich., Ind., Ohio
Lindarin	High	Medium	Med. tall	Good	Medium	High	Ill., Ind.
Lincoln	Medium	Late	Tall	Fair	Medium	High	SE Neb., Iowa, Ill., Ind., Ohio
Norchief	High	Early	Short	Good	Medium	High	N.D., Minn., Wis., Mich.
Ottawa Mandarin	High	Early	Short	V. good	Large	Medium	N.D., Minn., Wis.
Shelby	High	Late	Tall	Good	Medium	High	Ill., Ind., Ohio

FLAX VARIETIES

Variety	Yield	Maturity	Plant Height	Seed Size	Seed Color	Flower Color	Oil Content	Oil Quality	Disease Reaction*		
									Rust	Wilt	Psmo
Army	Medium	Late	Tall	Medium	Brown	Blue	Medium	Medium	I	R	MS
B-5128	High	Late	Medium	Medium	Brown	Blue	Medium	Low	I	MS	S
Bolley	Medium	Early	Medium	Medium	Brown	Blue	High	High	I	MR	S
Linda	Medium	Medium	Medium	Large	Brown	Blue	Medium	Low	R	R	S
Marine	Medium	Early	Medium	Small	Brown	Blue	Medium	High	I	R	MS
Norland	High	Late	Medium	Large	Brown	White	Medium	Medium	R	MS	S
Raja	Medium	Early	Medium	Medium	Brown	Blue	Low	Low	R	MR	S
Redwood	High	Medium	Medium	Medium	Brown	Blue	Medium	Medium	I	MR	S
Rocket	Medium	Medium	Medium	Medium	Brown	Blue	Medium	Medium	R	R	S
Royal	Medium	Medium	Medium	Medium	Brown	Blue	Medium	Low	MR	MS	S
Sheyenne	Low	Early	Short	Small	Brown	Blue	Medium	Medium	I	R	MS
Victory	Medium	Medium	Medium	Large	Brown	White	Medium	Medium	MR	MS	S

*Disease Reaction: R—resistant, S—susceptible, I—immune, MR—moderately resistant, MS—moderately susceptible

SPRING BARLEY VARIETIES

Variety	Yield	Matur- ity	Plant Height	Lodging Resistance	Seed Size	Bushel Weight	Malting Quality	Disease Reaction *			Main Areas Where Grown	Remarks
								Stem Rust	Spot Blotch	Loose Smut		
Custer	Med.	Early	Med.	Good	Med.	Med. high	Not known			S	Neb., S.D.	
Forrest	Med.	Med.	Med.	Good	Med.	Med.		R	MR	S	Minn.	New variety
Fox	Med.	Late	M. short	Good	Med.	Med.	Poor	R	MS	S	Wis.	Feed barley
Hiland	Med.	Late	Short	Good	Med.	Med.				R	Neb., S.D.	
Husky	Med.	Late	Med.	Med.	Small	Med.	Poor	R	S	S	N.D.	Feed barley
Kindred (L)	Med.	Early	Med.	Poor	Med.	Med.	V. good	R	MS	S	Upper Midwest	
Liberty	High	Med.	Med.	Good	Med.	Med.	Not known	R	S	MR	S.D., Iowa	
Montcalm	Med.	Late	Tall	Poor	Med.	Med.	V. good	S	S	S	Wis., Mich.	
Moore	High	Late	Med.	Good	Med.	Low	Poor	R	MS	S	Upper Midwest	Feed barley
Otis	Med.	Early	Short	Med.	Med.	Med.				S	Neb., S.D.	
Oderbrucker	Low	Med.	Med.	Poor	Med.	Med.	V. good	S	MR	S	Wis., Ill., Ind.	
Parkland	Med.	Late	Med.	Good	Med.	Med.		R	MS	S	N.D.	
Plains	High	Early	Short	Good	Med.	Med.	Poor	R	MS	S	S. D., Neb., Iowa	Feed barley
Spartan	Med.	Early	Tall	Good	Med.	High				S	S.D., Neb.	
Traill	High	Med.	Med.	Good	Med.	High	Good	R	MS	S	Upper Midwest	
Trebi	Med.	Late	Med.	Poor	Med.	Low				R	Neb., S.D.	
Tregal	High	Med.	Short	Med.	Med.	Med.	Poor	S	S	R	N.D.	Feed barley
Vantage	High	Med.	Med.	Good	Med.	Med.	Poor	R	S	S	N.D., Minn.	Feed barley
Vantmore	Med.	Late	Med.	Good	Small	Med.	Poor	R	MS	MS	N.D.	Feed barley

*Disease Reaction: R—resistant, S—susceptible, MR—moderately resistant, MS—moderately susceptible

SPRING WHEAT VARIETIES

Variety	Yield	Maturity	Plant Height	Straw Strength	Bushel Weight	Milling and Baking Quality	Resistance to*		
							Stem Rust	Leaf Rust	Loose Smut
Conley	Medium	Late	Tall	Good	Medium	Good	R	S	MR
Henry	High	Medium	Tall	Good	Medium	Poor	S	MS	S
Lee	Medium	Early	Short	Good	High	Good	S	MS	S
Rushmore	Medium	Early	Medium	Good	High	Good	S	S	MR
Russell	High	Medium	Tall	Good	Medium	Poor	MS	MS	R
Selkirk	High	Medium	Medium	Good	Medium	Good	MR	MR	R
Thatcher	Medium	Medium	Short	Good	Medium	Good	S	S	R

*Disease Reaction: R—resistant, S—susceptible, MR—moderately resistant, MS—moderately susceptible

DURUM VARIETIES

Variety	Yield	Maturity	Plant Height	Straw Strength	Bushel Weight	Milling and Baking Quality	Resistance to*		
							Stem Rust	Leaf Rust	Loose Smut
Langdon	High	Medium	Medium	Fair	High	Good	MS	MR	R
Mindum	Medium	Late	Tall	Fair	Medium	Good	S	R	R
Ramsey	Medium	Late	Med. tall	Good	Medium	Good	MR	R	R
Sentry	Medium	Early	Medium	Strong	High	Good	MS	R	R
Towner	Medium	Late	Tall	Good	High	Good	MR	R	R
Yuma	Low	Medium	Medium	Fair	Medium	Good	R	R	R

*Disease Reaction: R—resistant, S—susceptible, MR—moderately resistant, MS—moderately susceptible

HARD RED WINTER WHEAT VARIETIES

Variety	Yield	Maturity	Winter Hardiness*	Straw Strength	Milling and Baking Qualities	Resistance to**		
						Hessian Fly	Leaf Rust	Loose Smut Shattering
Bison	High	Early	Good	Strong	Excellent	S	S	S R
Cheyenne	High	Med. late	Very good	Strong	Excellent	S	S	S R
Comanche	High	Early	Good	Fair	Excellent	S	MS	S R
Concho	High	Medium	Fair	Fair	Good	S	S	R
Minter	High	Early	Excellent	Fair	Good	—	S	R R
Minturki	Medium	Early	Excellent	Medium	Good	—	S	R R
Nebred	High	Medium	Very good	Poor	Excellent	S	S	S R
Pawnee	Medium	Early	Good	Medium	Good	MR	MS	R S
Ponca	High	Early	Good	Medium	Excellent	R	MR	R R

*Winter Hardiness rating is for the area of adaptation only

**R—resistant, S—susceptible, MR—moderately resistant, MS—moderately susceptible

SOFT WINTER WHEAT VARIETIES

Variety	Yield	Maturity	Winter Hardiness*	Straw Strength	Quality	Seed Color	Reaction to **		
							Hessian Fly	Leaf Rust	Loose Smut
Blackhawk	High	Medium	Good	Medium	Good	Red	S	R	
Butler	High	Medium	Good	Strong	Fair	Red	S		R
Cornell 595	High	Medium	Good	Strong	Good	White	S	MR	R
Dual	High	Medium	Good	Strong	Excellent	Red	R	R	MR
Genesee	High	Medium	Good	Strong	Good	White	S		MR
Knox	High	Early	Good	Strong	Excellent	Red	S	R	MS
Racine	High	Medium	Fair	Medium	Fair	Red	S	MR	R
Seneca	High	Medium	Good	Strong	Good	Red	S	MR	S
Thorne	High	Medium	Good	Strong	Good	Red	S	MR	R
Vigo	High	Medium	Good	Strong	Excellent	Red	S	R	R
Vermillion	High	Early	Good	Strong	Excellent	Red	S	R	MR
Yorkwin	Medium	Medium	Good	Medium	Good	White	S		MR

*Winter Hardiness rating is for the area of adaptation only

**R—resistant, S—susceptible, MR—moderately resistant, MS—moderately susceptible

R Y E V A R I E T I E S

Variety	Yield	Maturity	Plant Height	Winter Hardiness	Lodging Resistance	Seed Size	Bushel Weight
Adams	High	Medium	Tall	Good	Medium	Medium	High
Antelope	High	Medium	Tall	V. good	Medium	Small	High
Balboa	High	Early	Med. tall	Fair	Good		
Caribou	High	Medium	Tall	V. good	Medium	Small	High
Dakold	Medium	Medium	Tall	V. good	Medium		
Elk	High	Late	Medium	Fair	Good	Medium	Medium
Emerald	Medium	Medium	Tall	V. good	Poor	Small	Medium
Imperial	Medium	Medium	Tall	Good	Medium	Medium	Medium
Pierre	Medium	Early	Tall	V. good	Good	Small	High
Tetra Pektus	Medium	Late	Tall	Fair	V. good	V. large	Low

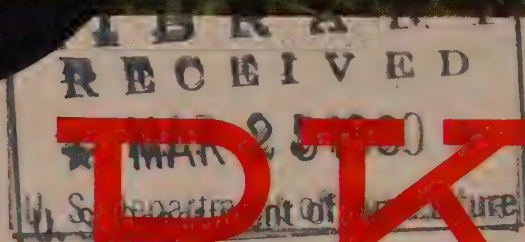
COMMONLY USED PLANTING RATES

Accepted Bushel Weights

REQUIRED FOR PLANTING ONE ACRE

VARIETY	Lbs. per bu.	Lbs. per acre
Alfalfa	60	12 to 15
Barley	48	72 to 96
Beans, Field	60	40 to 60
Beans, Lima	60	60 to 90
Birdsfoot Trefoil	60	4 to 8
Brome Grass (Bromus Inermis)	14	15 to 20
Buckwheat	50	50
Clover, Alsike	60	8 to 10
Clover, Ladino	60	2 to 8
Clover, Medium Red	60	10 to 12
Clover, Mammoth Red	60	10 to 12
Clover, Sweet	60	12 to 15
Clover, White	60	5 to 8
Corn, for grain	56	7 to 10
Corn, in drills for silo where ears are desired	56	9 to 12
Corn, for soiling	56	30 to 56
Flax	56	30 to 42
Grass, Canadian blue (solid seed)	14	15 to 25
Grass, Crested Wheat	20	10 to 12
Grass, Kentucky blue (solid seed)	14	20 to 30
Grass, English or Perennial Rye Grass	24	25 to 30
Grass, Italian Rye Grass	24	35 to 40
Grass, Meadow Fescue	24	20 to 30
Grass, Orchard	14	15 to 20
Grass, Red Top (solid seed)	32	8 to 12
Grass, Reed Canary	32	4 to 8
Grass, Lawn Seed, 1 lb. for 300 sq. ft.	—	100 to 125
Grass, Western Rye or Slender Wheat Grass	14	12 to 15
Grass, Meadow Fox Tail	14	15 to 20
Grass, Tall Meadow Oat	14	25 to 35
Millet, for hay	50	30 to 50
Millet, for seed	50	20 to 30
Milo	56	4 to 6
Oats	32	64 to 96
Peas, in drills	60	120 to 150
Peas, broadcast	60	150 to 180
Rape Dwarf Essex, alone, broadcast	50	6 to 8
Rape Dwarf Essex, alone in drills	50	4
Rye	56	56 to 84
Sorghum, for fodder	56	20 to 30
Sorghum, for grain	56	4 to 6
Soybeans, in 40-42 inch rows	60	45 to 50
Soybeans, in 30-36 inch rows	60	60
Soybeans, in solid drilling	60	120
Speltz	40	80
Sudan Grass, broadcast	40	20 to 30
Sudan Grass, in drills	40	8 to 12
Timothy	45	10 to 12
Vetches, broadcast	60	50 to 60
Wheat	60	60 to 90

Announcing...
a new
LAWN
GRASS



PARK

KENTUCKY BLUEGRASS

- Comes up quicker
- Grows more vigorously
- Champion competitor
- Resists rust

Easier to establish than any other bluegrass



PARK Kentucky bluegrass sprouts faster and emerges much more quickly than any other bluegrass that is commercially available.

This fast start and exceptional seedling

ROOTS TELL THE STORY. Photo shows typical root growth of three bluegrass varieties planted the same day.



IMPROVED
VARIETY "B"

PARK

IMPROVED
VARIETY "A"

ish than rass available!

vigor give PARK Kentucky bluegrass several important advantages.

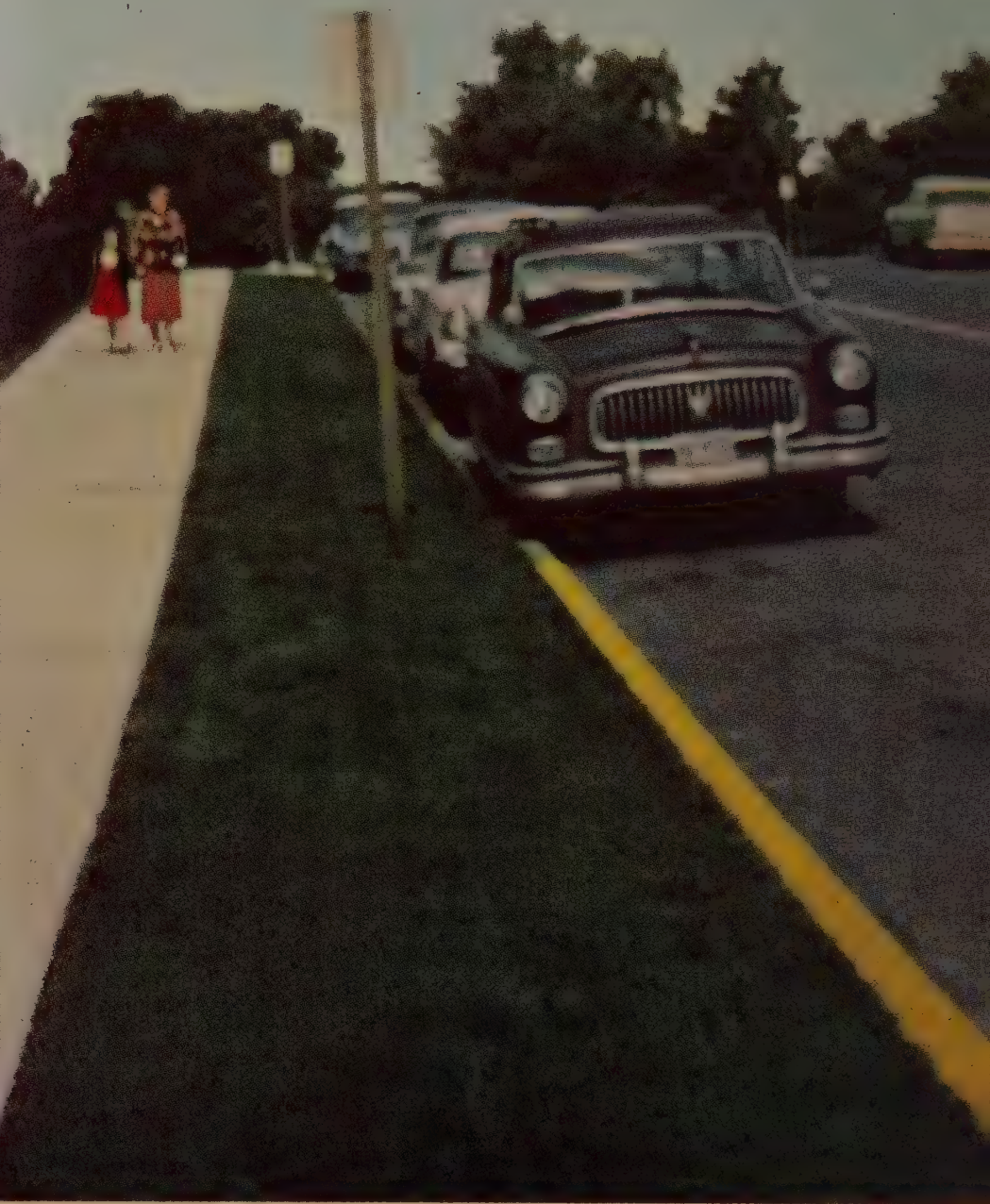
In tests conducted by state experiment stations, PARK has proved superior in percentage of stand, rate of growth, density and quality of turf, and in its ability to compete against weeds.

This means that PARK is easier to establish, especially under unfavorable conditions. It competes more successfully against fast-growing nurse grasses as well as against weeds, and produces a handsome turf within weeks of seeding . . . a "show lawn" of which you will be justly proud.

CHAMPION WEED COMPETITOR

Because of its fast start and rapid seedling growth, PARK Kentucky bluegrass has proved itself to be an extremely successful fighter against crabgrass and other weeds.

This ability to combat weeds was studied by the University of Minnesota in seven separate comparisons at four of its experiment stations. In every single case, there were fewer weeds in the PARK seedings than in any of the other bluegrasses tested. Average of the seven Minnesota tests showed that the PARK plantings contained *less than half* as many weeds as common bluegrass and less than a quarter the weeds



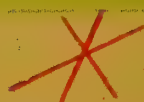
87 days after seeding! Planted to PARK Bluegrass on May 15, photo taken August 10. Because of poor soil and other unfavorable conditions, previous attempts to obtain stands with other bluegrass failed.

which occurred in one of the other frequently grown varieties.

HIGHLY RESISTANT TO DISEASE

Comparisons show that PARK Kentucky bluegrass is one of the most rust-resistant of all bluegrasses. In years when rust has browned lawns which had been seeded to other bluegrass, PARK lawns have stayed a beautiful green all season long.

What enthusiastic growers say about **PARK** Kentucky bluegrass



MICHIGAN Business Executive. "Never supposed a lawn could be started so quickly from seed. My **PARK** was up in seven days. The following day, the whole area looked green."

NEW YORK Doctor. "My planting of 5 pounds of **PARK** Kentucky bluegrass is an outstanding success. It's much greener and thriftier than my regular Kentucky bluegrass."

MINNESOTA Housewife. "Prettiest lawn in our block! A lot of our friends are planting **PARK** this year because they've admired our lawn."

CONNECTICUT (Horticultural editor of a leading garden magazine). "**PARK** proved highly desirable in southern Connecticut. I shall be glad to recommend it."

IOWA DEALER. "We have checked back with a number of our customers to whom we sold **PARK** Bluegrass and in each instance they have been more than pleased with its performance."

MINNESOTA GARDEN CLUB. "We used **PARK** exclusively in our big annual civic beautification project. Despite poor soil and miserable weather, we got a dense, near-perfect stand. Wonderful color, too."

MIDWEST AGRICULTURAL COLLEGE. "**PARK** is decidedly superior to Merion in seedling vigor. This character is reflected in percentage of stand, competition with weeds, and plant vigor."



**FASTER
STARTING!**

How **PARK**

BLUEGRASS *was developed*



Back in 1937, Dr. H. K. Hayes, head of the University of Minnesota's agronomy department, collected 281 vigorous individual bluegrass plants from 60 different locations throughout Minnesota.

After sixteen years of careful selection and testing, Dr. H. L. Thomas was able to select 15 strains which had proved strikingly superior in vigor, total yield, midsummer growth, disease resistance, and uniformity.

In 1953, these 15 superior strains were combined and increased under the temporary designation of Minnesota 95. By this time, comparative tests had shown Minnesota agronomists that they'd produced a truly superior bluegrass. By 1955, requests for seed were received from agronomists in Michigan, Ohio, Indiana, Iowa, Kansas, No. Dakota and Alaska.

Reports from these stations confirm the Minnesota results and emphasize the remarkably fast start and vigor of this spectacular new bluegrass.

In 1956, the variety was officially named **PARK**.

All foundation and certified **PARK** Kentucky Bluegrass seed is grown under careful control and supervision by the University of Minnesota and the Minn. Crop Improvement Ass'n.

PARK

KENTUCKY BLUEGRASS



ORDER YOUR SUPPLY NOW!

**Northrup King is nationwide, to help
you get more from every acre.**



ARIZONA

Phoenix
Yuma

CALIFORNIA

Bakersfield
Berkeley
Fresno
Imperial
Los Angeles
Modesto
Yuba City

COLORADO

Denver

IDAHO

Boise
Nampa
St. Anthony
Twin Falls

ILLINOIS

Rochelle

IOWA

Cedar Rapids
Des Moines
Hampton
Washington
Waterloo

MINNESOTA

Hopkins
Howard Lake

Lake Crystal

Minneapolis
Moorhead
Shakopee
Waterville

MONTANA

Billings

NEBRASKA

Norfolk

OREGON

Albany
Halsey
Portland

OHIO

Lima

TEXAS

Richardson
Lubbock

UTAH

Delta
Salt Lake City

WASHINGTON

Harrah
Seattle

WISCONSIN

Madison

WYOMING

Greybull



CORN - SORGHUM - ALFALFA



This booklet is a valuable source of information about major farm crops. You'll find it a good addition to your farm library. For any information about seeds, contact your local Northrup King dealer or write to any of the following Northrup King headquarters:

Midwest Division: Minneapolis 13, Minn.
Intermountain Division: Boise, Idaho
Pacific Division: Fresno, California